Enhancing access to electricity for clean and efficient energy services in Africa

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Key topics for talk

- The access challenge
- Access levels & Energy Plus
- Role for renewable energy
- Focus on electrification
- National examples and regional experience
- Key recommendations for national action
- Ways the international community can support national action

Access Challenge

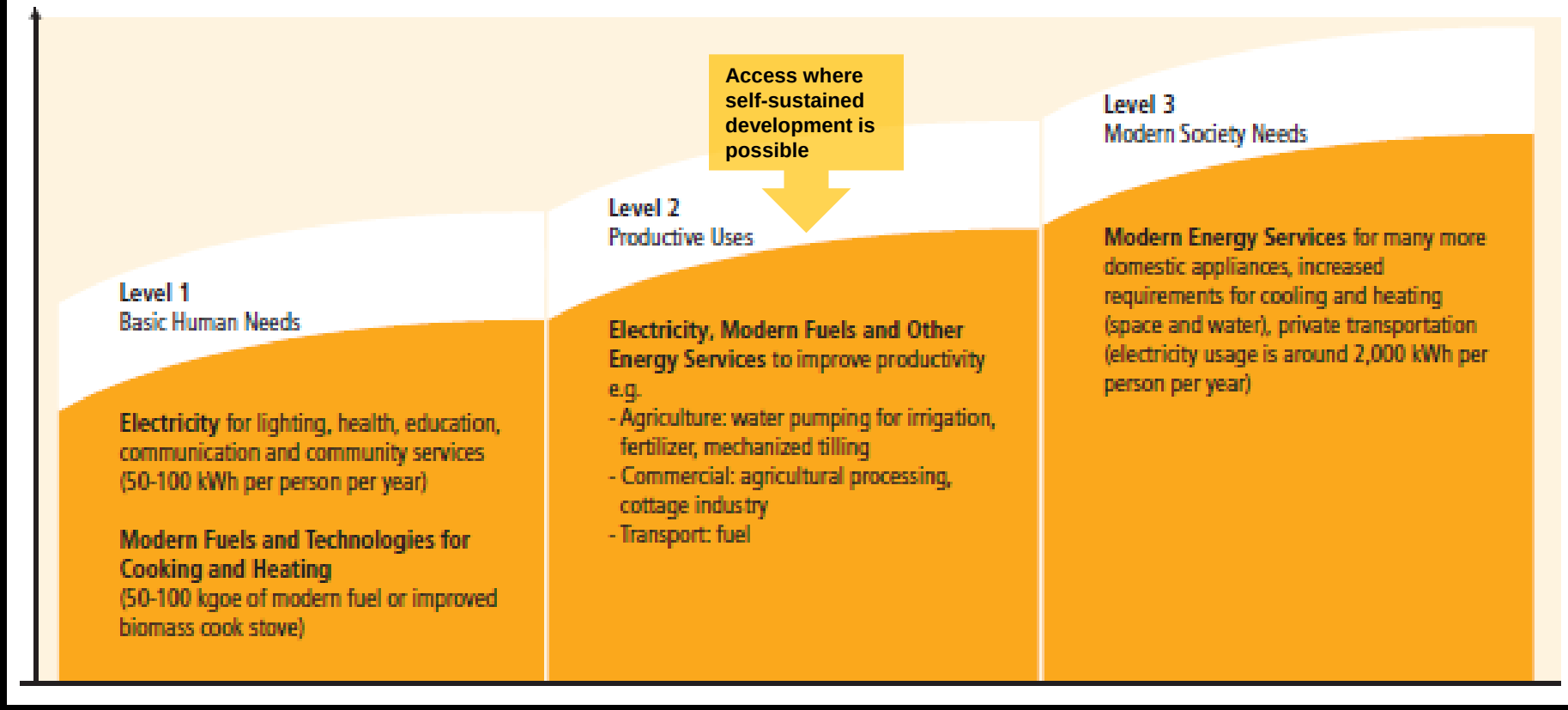
	2009			2015	2030	2009	2015	2030
	Rural	Urban	Total	Total	Total	%	%	%
Africa	466	121	587	636	654	42	45	57
Sub-Saharan Africa	*465*	*120*	*585*	*635*	*652*	*31*	*35*	*50*
Developing Asia	716	82	799	725	545	78	81	88
China	*8*	*0*	*8*	*5*	*0*	*99*	*100*	*100*
India	*380*	*23*	*404*	*389*	*293*	*66*	*70*	*80*
Other Asia	*328*	*59*	*387*	*331*	*252*	*65*	*72*	*82*
Latin America	27	4	31	25	10	93	95	98
Developing countries*	1229	210	1438	1404	1213	73	75	81
World**	**1232**	**210**	**1441**	**1406**	**1213**	**79**	**81**	**85**

*Includes Middle East countries; **includes OECD and transition economies.

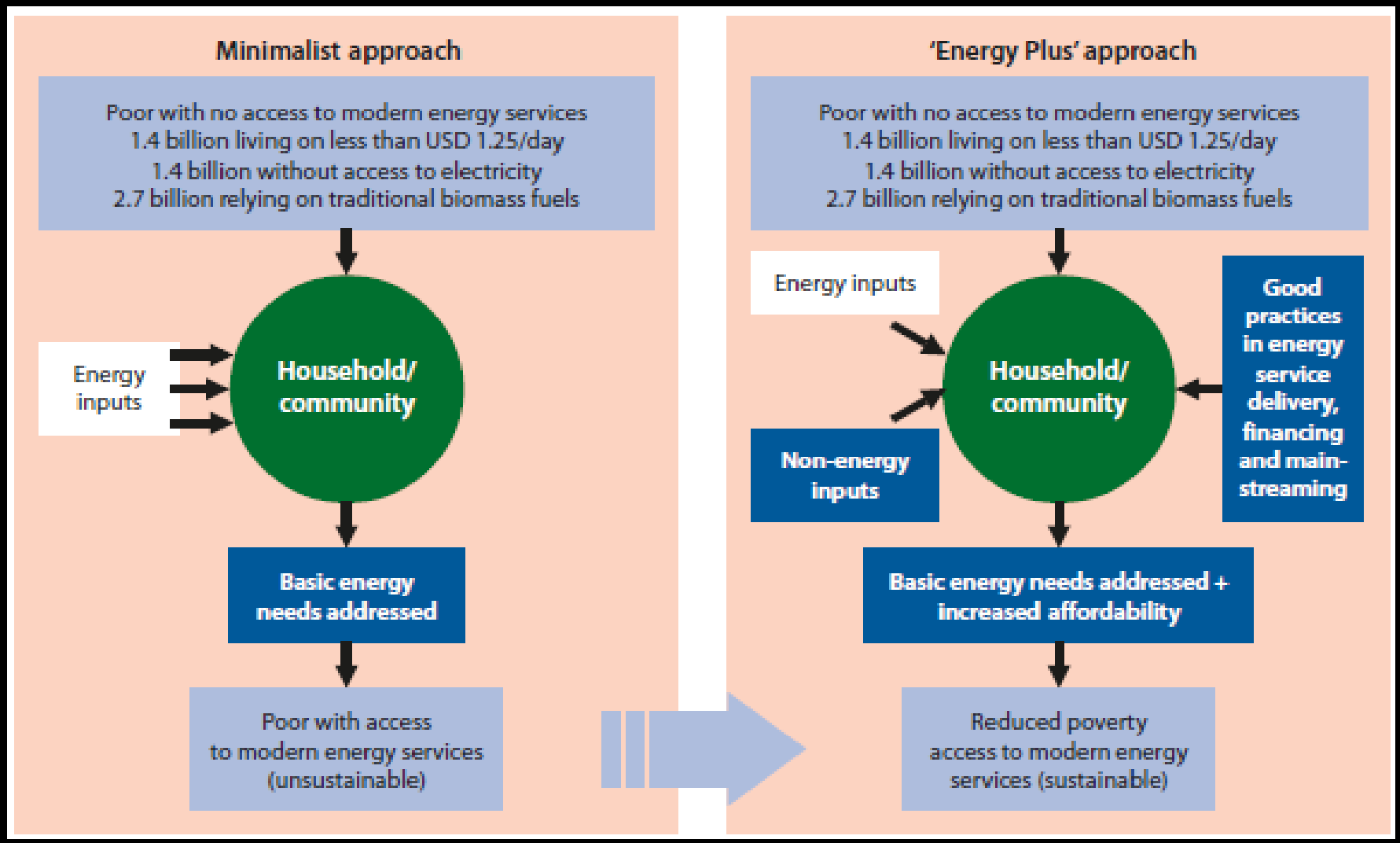
Millions without access to electricity (IEA figures)

Region	Total (millions) Biomass cooking
Africa	**657**
Sub-Saharan Africa	**653**
Developing Asia	**1937**
China	**423**
India	**855**
Other Asia	**659**
Latin America	**85**
Developing countries*	**2679**
World**	**2679**

Understanding access - AGECC concept



Understanding access - Energy Plus approach



Increasing role for Renewable Energy in provision of access

Rural Energy Service	Existing Off-Grid Rural Energy Sources	Examples of New and Renewable Energy Sources
Lighting and other small electric needs (homes, schools, street lighting, telecom, hand tools, vaccine storage)	Candles, kerosene, batteries, central battery recharging by carting batteries to grid	• Hydropower (pico-scale, micro-scale, small-scale) • Biogas from household-scale digester • Small-scale biomass gasifier with gas engine • Village-scale mini-grids and solar/wind hybrid systems • Solar home systems
Communications (televisions, radios, cell phones)	Dry cell batteries, central battery recharging by carting batteries to grid	• Hydropower (pico-scale, micro-scale, small-scale) • Biogas from household-scale digester • Small-scale biomass gasifier with gas engine • Village-scale mini-grids and solar/wind hybrid systems • Solar home systems
Cooking (homes, commercial stoves and ovens)	Burning wood, dung, or straw in open fire at about 15 percent efficiency	• Improved cooking stoves (fuel wood, crop wastes) with efficiencies above 25 percent • Biogas from household-scale digester • Solar cookers
Heating and cooling (crop drying and other agricultural processing, hot water)	Mostly open fire from wood, dung, and straw	• Improved heating stoves • Biogas from small- and medium-scale digesters • Solar crop dryers • Solar water heaters • Ice making for food preservation • Fans from small grid renewable system
Process motive power (small industry)	Diesel engines and generators	• Small electricity grid systems from microhydro, gasifiers, direct combustion, and large biodigesters
Water pumping (agriculture and drinking water)	Diesel pumps and generators	• Mechanical wind pumps • Solar PV pumps • Small electricity grid systems from microhydro, gasifiers, direct combustion, and large biodigesters

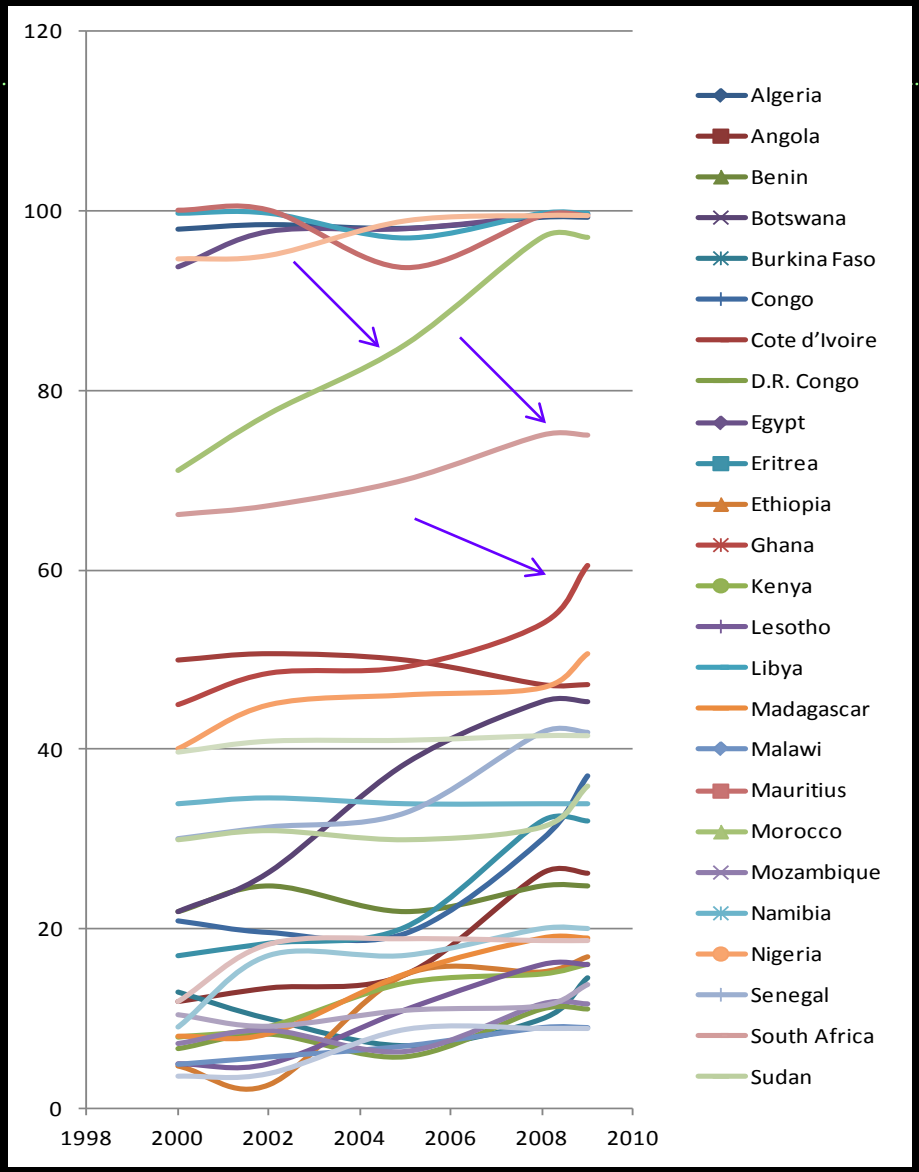
Focus on electrification in Africa

- Half of the population – approx. 500 million - living on the African continent have no access to electricity today
- Without dedicated national and international action this number will increase and in 10 years half of the people in the world without access to electricity will be on the African continent
- For most African countries the “ultimate access objective” is to provide electricity to the whole population
- Focus on electricity does not imply that other options for clean energy services are not important and many will play a crucial role in an integrated access strategy

Electrification levels expansion from 2000 to 2009

Learning from national experiences

- Ghana
  - 30% in 1992
  - >60% in 2010
- Morocco
  - <20% in1995
  - >95% in 2010
- South Africa (rural)
  - 20% 1995
  - >55% in 2010



Factors analyzed

- Government commitment
- Policies and Institutions
- Financing
- Subsidies and Tariffs
- Data, Planning & Prioritization
- Grid and/or Off-grid solutions
- Role of Renewable Energy
- Cost reduction measures
- Engaging of local communities
- Local champions
- Skills and capacity requirements

Additional experiences and common elements

Additional experiences

- The three national studies have been complemented by a study by Club ER (association on rural electrification agencies in 25 African countries)
- ADB case study of electrification in Vietnam
- IEA analysis of electrification experiences in BRIC
- WB studies of electricity development in Africa
- Plus benefited from comments and conversations with a number of African energy experts.

Unique & common elements

- All countries have their own unique experience reflecting specific political, institutional, cultural and natural conditions
- However, many of the factors behind the successful programs have common elements providing guidance for other countries
- Programs in all countries have been dynamic, adjusting to emerging challenges and changing conditions plus generally reflect willingness to learn from failures

Key Issues for national electrification programs

Key Issues for national electrification programs - I

Political commitment

- Strong and sustained government support is the single most important pre-conditions for success (but not sufficient)
- Supporting factors
  - Local political pressure
  - Champions
  - Development nexus
  - International dialogue and targets

Institutional strength

- A strong central institution in charge of the overall electrification program is essential.
- No superior model either a government agency, a utility or a dedicated independent institution

Key Issues for national electrification programs - II

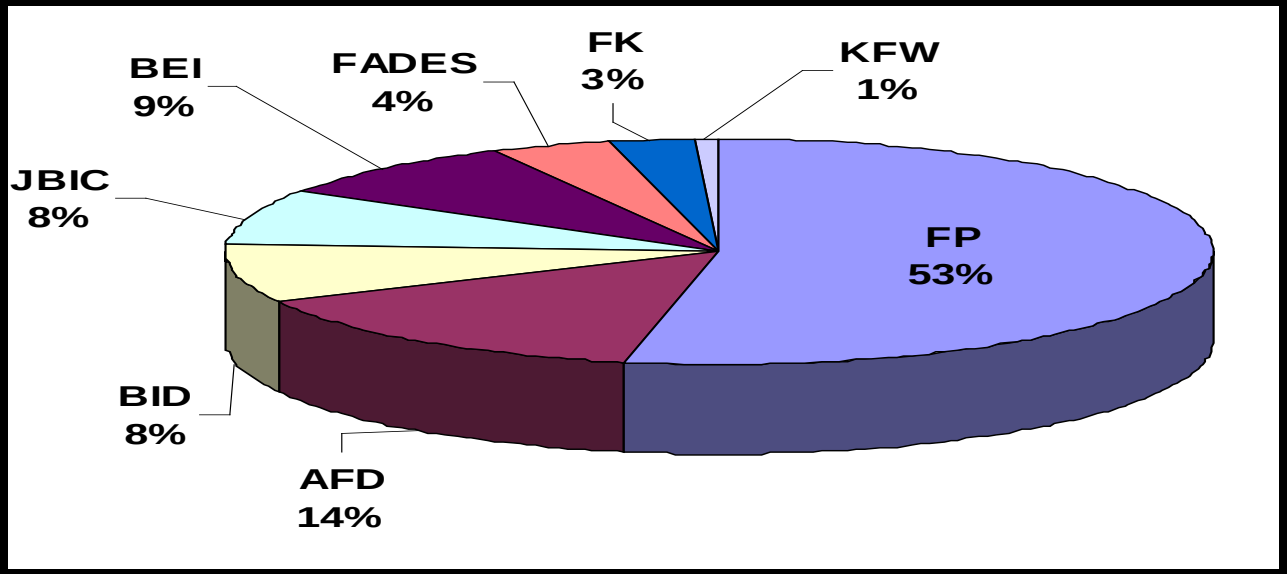
Integrated national plan

- Integrated electrification and development plan covering a span of several decades needs to be developed as a basis for prioritization of actions
- Plan should balance central grid expansion, local mini-grids and off grid solutions and link closely with development efforts

Finance challenge

- Finance needs beyond current resources
- National and International funding for planning and institutional strengthening + possible subsidies
- PPPs crucial for engaging privates sector in implementation

Moroccan finance arrangements



PERG programme pre-financing

AFD	Agence Française de Développement
BEI	European Investment Bank
BID	Islamic Development Bank
FADES	Arab Fund for Economic & Social Development
FP	ONE own funds (cross subsidies)
JBIC	Japan Bank for International Cooperation
KfW	German development bank
FK	Kuwait Fund

Financing combined

- ONE (power company)
- Local governments
- Households

Key Issues for national electrification programs - III

Pro-poor subsidies and tariffs

- Access programs require some form of government subsidy. Investments and tariffs need to be designed to allow connection and use by target groups
- Subsidies, tariffs and consumer payment in combination need to ensure full cost recovery for the service deliverer to make the provision sustained

Stimulating productive uses

- Focusing on productive uses in the access definition and any national programs is essential for achieving the desired economic development benefits
- Involvement of local communities and a broad range of development stakeholders (ministries, private sector, NGOs etc.) is conducive to achieving desired results

Key Issues for national electrification programs - IV

Role of Renewable Energy

- RE can make important contributions both for central and de-centralized systems.
  - Stand alone PV systems good for social not productive use
  - Mini-grids with mix of RE technologies offer promising perspectives, including local productions and maintenance
  - Hydro already dominating many central systems and have significant potential regionally. Geothermal, wind, solar and modern biomass starting to make real contributions, but need policy support and understanding

Integration & Transition

- Important to design plans and implementation for gradual build up.
  - Design solutions for gradual expansion e.g. making mini-grids “grid ready” so they can become integral parts of long term interconnected systems
  - Combining non electrical options with initial electrification efforts
  - Avoiding lots of pilot efforts with no long term perspective
  - Realizing that it will take time
  - Evaluating “take off” levels where consumer base is sufficient

Key Issues for international support

Key Issues for international support - I

Creating the political momentum

- International focus and target setting like “Energy year campaign” and AGECC proposal on access for all in 2030
- Awareness raising about development and social benefits
- Prioritizing access in bilateral and regional dialogues

Institutional and policy support

- Differentiated and targeted support for institutional strengthening focusing on countries with low electrification levels
- Support for private sector, local government and community engagement would represent a parallel (or integrated) set of actions

Key Issues for international support - II

Stimulating regional cooperation

- Cooperation at regional (AU) or sub-regional level is increasingly important and needs support
- Regional power-pools have potential to make structures more effective and robust
- Partnerships like the EU – Africa Energy provide political momentum also for access

Providing increased and targeted financing

- Significantly increased grant funding required for institutions, planning and possible subsidy schemes
- International concessional finance should be increased
  - RE expansion centrally
  - Enhanced mini-grid structures and establishment of local productive engagement

Key Issues for international support - III

Enhanced donor coordination

- The challenge of massive scale up of electricity access in a large number of African countries can only be overcome if all actors work closely together
- Need to make energy access a priority area for all relevant multilateral organizations and provide the funding to make it happen

Internal donor coherence

- Significantly increased internal coordination, providing both an access priority and focus on energy aspects in other sector and broader development programs
- Long-term engagement is as important for donors as for countries

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Sustainable energy for all

Is an immensely complicated challenge,

but political commitment

and dedicated action at all levels

can make it happen,

as demonstrated by select countries

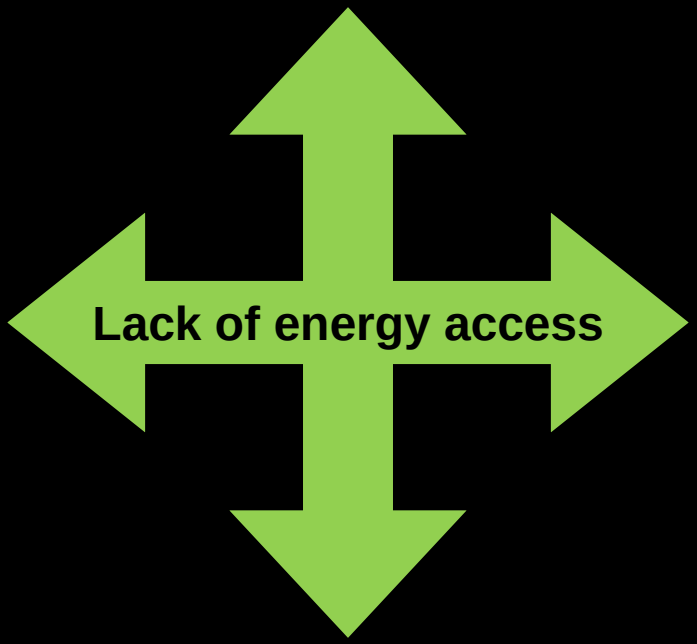
Photo: Courtesy Selco

All options need to be considered and be part of an integrated solution

Importance of energy access

Constrains delivery of social services

Increases gender inequality



Entrenches poverty

Erodes environmental sustainability

Thank you for the opportunity

Comments on the draft paper are welcome on:

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